Newfound River
Pemigewasset River Watershed
Merrimack River Basin
New Hampshire

Newfound Lake Dam - Break Flood Delineations

July 1990

US Army Corps of Engineers
New England Division

NEWFOUND LAKE DAM
DAM-BREAK FLOOD ANALYSIS

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NEWFOUND LAKE DAM
DAM-BREAK FLOOD ANALYSIS

1. PURPOSE AND SCOPE

This report is a continuation of a dam-break flood analysis, on the Newfound Lake Dam, completed by the U.S. Army Corps of Engineers, dated January, 1989. The study's objective is to delineate and quantify the extent of the probable inundation flood area in the event of a dam-break failure, so that such information is available for use in emergency planning. This study was not performed because of any known likelihood of a dam-break at Newfound Lake Dam. Newfound Lake Dam is located in Bristol at the beginning of the Newfound River. The center of town is downstream from the dam. It is owned, operated and maintained by the Water Resources Board of New Hampshire. This study is limited to the accuracy of five-foot-contour mapping.

Delineations were continued downstream to a point at which the inundation from a dam-break approximates that of a one-hundred year storm even. The limits of the study are shown in Plate 2.

2. AUTHORITY

Authority for U.S. Army Corps of Engineers participation in this effort is sanctioned by Section 206 of the 1960 Flood Control Act (Public Law 86-645) which states:

"... The Secretary of the Army, through the Chief of Engineers, Department of the Army, is hereby authorized to compile and disseminate information on floods and flood damages, including identification of areas subject to inundation by floods of various magnitudes and frequencies, and general criteria for guidance in the use of floodplain areas and to provide engineering advice to local interests for their use in planning to ameliorate the flood hazard..."

3. DAM DESCRIPTION

Identification No.	NH00137
Name of Dam:	Newfound Lake Dam
Town:	Bristol
County and State:	Grafton County, New Hampshire
Stream:	Newfound River
Watershed:	Pemigewasset River
Basin:	Merrimack River

Newfound Lake Dam is located on the Newfound River in Bristol (Plate 1), impounding approximately 27,000 acre-feet of water. The dam is a concrete and masonry structure founded on a timber crib. The dam spans the Newfound River and has a length of 111.0 feet. The dam's foundation materials are believed to consist of coarse silty gravelly sands. The lake is of natural origin, but its level has been

raised by the construction of the dam. The dam consists of three distinct sections: a timber dam, a sluice gate section, and a stop plank section. The timber dam, approximately 48 feet long at the right abutment, terminates at a concrete or masonry abutment wingwall. The timber dam has 12 sets of stop plank openings approximately three-and-one-half feet wide. On the left, the timber dam is separated from an adjacent sluice gate section by a massive concrete faced masonry pier approximately 13.5 feet wide. The sluice gate section contains three 6-by-6 foot timber sluice gates operated manually or by portable electric drill. The sluice gates section is separated on the left from an adjacent newly built stop plank section by a massive concrete faced masonry pier approximately 11.5 feet wide on which a gate access house has been built. The stop plank section consists of 2 bays approximately 4.67 feet wide by 6.7 feet deep, below the full lake elevation of 589.1. The stop plank section terminates at the left abutment wingwall. Maximum storage is 41,244 acre-feet.

4. PERTINENT DATA

Data is taken from "Phase I Inspection Report" for Newfound Lake Dam, dated August, 1978.

a. Drainage Area The drainage area consists of 95 square miles (60,800 acres) of predominantly wooded, moderately sloped terrain with some residential areas.

b. Elevation (ft. above MSL)

(1)	Top of Dam:	592.1
(2)	Recreation pool:	589.1
(3)	Spillway crest:	588.4 (flashboards in place)
(4)	Spillway crest (ungated):	588.4
(5)	Stream bed at centerline of dam	580.0
(6)	Maximum tailwater:	Unknown

c. Spillway

(1)	Type:	Stop plank sections
(2)	Length of weir:	Timber dam length 43.5 ft., new stop plank section 13.0 ft., total length 55.5 ft.
(3)	Crest elevation:	588.4 ft. (stop planks in place)
(4)	Gates:	None
(5)	U/S channel:	Newfound River

(6)	Downstream channel:	Timber plank and concrete apron, Newfound River

d. Reservoir (miles)

(1)	Length of maximum pool:	6.30 (estimated)
(2)	Length of recreation pool:	6.16 (estimated)

e. Storage (acre-feet)

(1)	Recreation pool:	24,600 (elev. 588.4)
(2)	Design surcharge:	27,715 (elev. 589.1)
(3)	Top of dam:	41,244

f. Reservoir Surface (acres)

(1)	Top of dam:	4,670
(2)	Recreation pool:	4,360
(3)	Spillway crest:	4,360

g. Discharge at Dam Site

(1) Maximum known flood at dam site: 1,840 cfs in the period since the reconstruction of dam or 1977-1978

(2) Ungated spillway capacity at pool elevation: 500 cfs, all stop planks in maximum place to elevation 588. Pool at elevation 589.1

(3) Total spillway capacity at maximum pool elevation: As above

h. Dam

(1)	Type:	Masonry and concrete gravity dam with a timber section
(2)	Length:	117 ft.
(3)	Height:	12 ft.
(4)	Top width:	Varies

i. Diversion and Regulating Tunnel: None.

end of the area and

[illegible] section of rubble masonry wall [illegible] the south

j. Regulating Outlets.

(1)	Low level outlet:	3 passes, each 6 x 6 feet
(2)	Controls:	Timber sluice gates,hoist operated
(3)	Emergency gate:	Provisions for the stop planks on upstream side
(4)	Outlet:	Concrete apron slab

5. DOWNSTREAM COMMUNITY INFORMATION

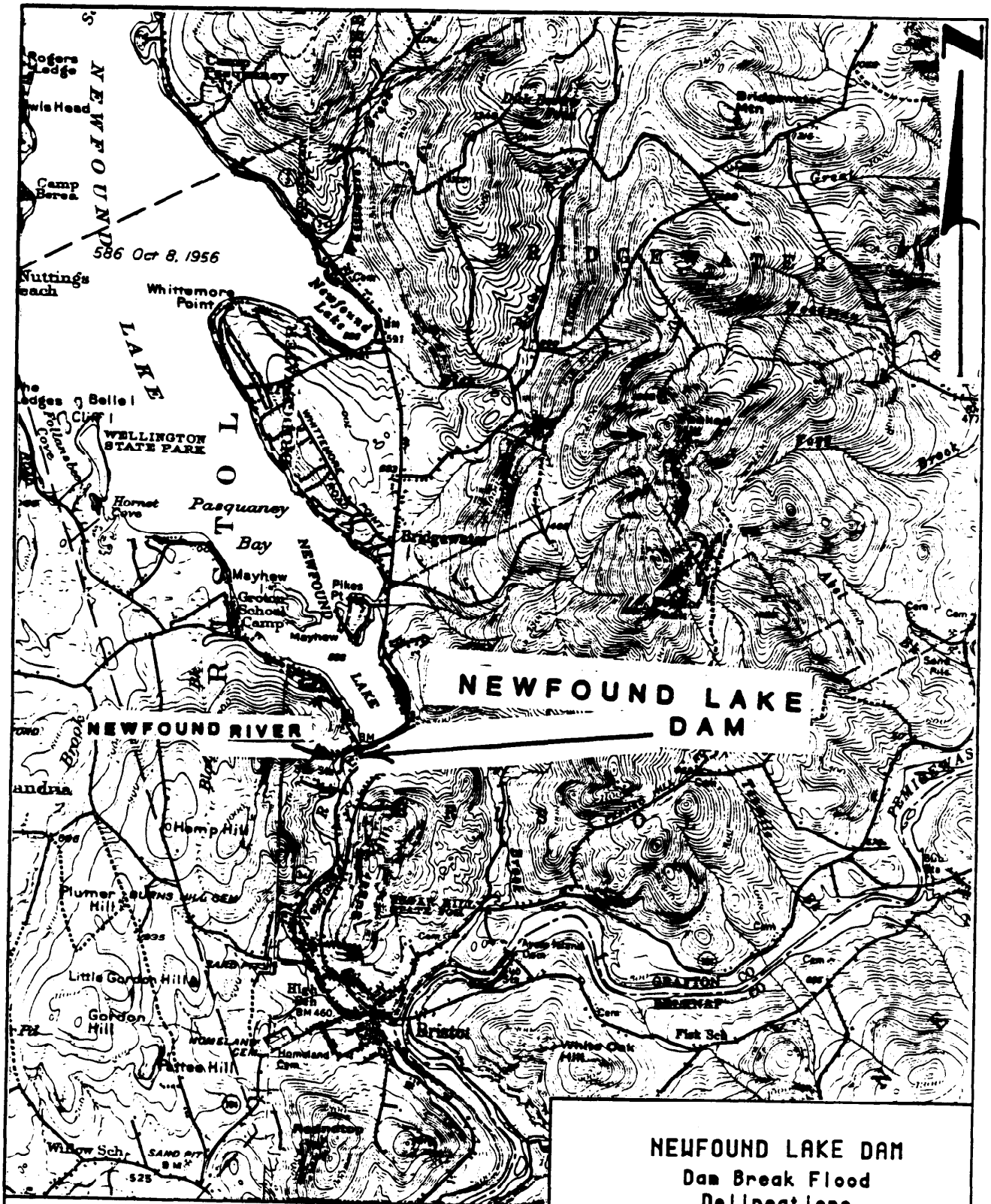
Downstream of the Newfound Lake Dam is the Town of Bristol, a predominantly residential community, located in the southeastern part of Grafton County, in central New Hampshire. The town office cites Bristol's current population at 2700 persons. It was 2198 persons in 1980, according to US Census Bureau information, (which was a 32% increase over the 1970 population).

Bristol has a strong summer economy, supported by tourists and visitors, staying at numerous camps and cabin colonies, along Newfound Lake. The lake, which is partially situated in Bristol, provides recreation in the form of swimming, boating, and fishing. During the winter, there is also ice fishing on the lake. The town's economy is also supported by a small amount of industrial and agricultural activity. There is a concentrated population area, at the town center, located downstream of the dam.

6. DESCRIPTION OF INUNDATED AREAS

a. REFERENCES. The inundation map for emergency action plan (Plate 2) is developed from the January 1989, Newfound Lake Dam-Break Flood Analysis, using 1968 mapping furnished by the New Hampshire Department of Transportation.

b. DESCRIPTION OF IMPACTED AREA. The dam is situated at the beginning of the Newfound River, approximately 400 feet from the West Shore Road bridge. In the immediate area downstream of the dam is a wooded area, with one house. Farther downstream, in the area of probable inundation, there are a dozen homes and small businesses. Beyond that is a concentrated area at the town center, which is both residential and commercial. There is also a school located in this area. The area of inundation is paralleled by Route 3A and includes three bridges. Downstream of the study area is the confluence of the Newfound River with the Pemigewasset River, which eventually discharges into the Merrimack River, in Franklin.



NEWFOUND LAKE DAM

Dam Break Flood Delineations

Location Map

U.S. Army Corps of Engineers

Plate 1

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FOR THE:

NEW HAMPSHIRE
WATER RESOURCES DIVISION
DEPARTMENT OF ENVIRONMENTAL SERVICES

NOTES:

1- Mapping is a photographic reduction of maps dated 1968 as furnished by the New Hampshire Department of Transportation.

2- A section within the vicinity of Newfound Lake was traced from a photographic enlargement of the U. S. G. S. 15 minute (1: 62,500) Penacook Quadrangle map, as revised in 1956.

SCALE IN FEET
400' 0 400' 800'

INUNDATION MAP FOR EMERGENCY ACTION PLAN (EAP)

NEWFOUND LAKE DAM
N. H. NO. 31.01

DEC. 1980

PLATE 2